

Title: Recent Advances in Ozone Data Assimilation at the GMAO - Towards a New Reanalysis

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Abstract

This presentation summarized ongoing work on improving the representation of ozone in the GEOS Data Assimilation Systems. Data from two EOS Aura sensors was used: the total column ozone from the Ozone Monitoring Instrument (OMI) and high vertical resolution stratospheric profiles from Microwave Limb Sounder (MLS, version 3.3). As several previous studies have demonstrated, assimilation of this data can constrain the stratospheric and tropospheric ozone columns with relatively good accuracy. However, the representation of the vertical structures in the troposphere and near tropopause region is often deficient. Since both these layers of the atmosphere are critical to the understanding of the radiative forcing as well as the ozone budget in the troposphere, current work will focus on improving the assimilated product between the surface and the 50 hPa pressure level.

The discussion included recent steps that have been taken towards refining the treatment of ozone in GEOS-5. Impacts of improved tropospheric chemistry model were discussed including the introduction of efficiency factors ("averaging kernels") for OMI total ozone, and direct assimilation of radiances from the MLS instrument. In particular, advantages and challenges involved in assimilating limb radiances rather than retrieved product were discussed. This work is, in part, a preparation for a planned reanalysis of the EOS Aura data from 2005 to present.